PATINA FORMULA HANDOUTS FROM BRYANT LABORATORY.

The following pages are scans of several editions of a handout that was offered by Bryant Laboratory in Berkeley, California, throughout the 1980s and 1990s, before it went out of business. Bryant Lab was an important supplier of patina chemicals to artists across North America during the boom in patina use in that period.

There is extensive repetition from one version to the next, but they are not identical. Many of these formulas are available in published books, but not all, so these were scanned for the Internet Archive, to make the formulas available worldwide.

Metal Patination has inherent risks and should not be attempted unless you know what you are doing, and take precautions including, but not limited to, specialized active ventilation, proper breathing protection for chemical vapors (not just a dust mask), eye protection, face and hand protection.

You should request and study Material Safety Data Sheets on all chemicals you consider using, and think twice before using ones whose use may emit dangerous fumes or have other hazardous effects. Use any of these entirely at your own risk.

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The following Patina Formulas are but a sampling of the hundreds in existence. The formulas selected illustrate the wide range of application methods employed, as well as a rich variety of colors.

PATINA FORMULAS

1. Light to dark brown (basic brown) (Clerke)

Ferric Nitrate	1/2 teaspoon
Water	1 pint

A hot process, transparent color. Fresh mixture necessary for each coloring. Preservative is optional.

2. Antique Green (miller)

Cupric Nitrate	40 grams
Ammonium Chloride	40 grams
Calcium Chloride	40 grams
Water	To make one liter (approx. 1 qt)

A cold process, opaque patina. Frog green results after several application, 1/2 hr. intervals. Color is not satisfactory alone. Combines well with most brown and black cold process patinas. Preservative is optional.

3. Matte Brown (Rich)

Barium Sulphide	1 ounce
Potassium Sulphide	1/4 ounce
Ammonia	2 fluid ounces
Water	3 to 5 quarts

An excellent cold process, opaque patina that darkens immediately after application. The matte color is best without a preservative, although choice is optional.

4. Yellow Green (Clerke)

Ammonium Chloride	7 parts by weight
Copper Acetate	4 parts by weight
Water	8 parts by weight

A cold process, heavy opaque patina that takes effect after several applications, preservative is optional.

5. Rust Brown (payne)

Ferric Nitrate	3 ounces
Perchloride of iron	2 ounces
Water	1 to 3 quarts

An excellent, cold process, opaque patina. It achieves immediate effects, preservative not necessary.

6. Blue (Miller)

Sodium Thiosulphate	60 grams
Nitric Acid	4 grams
Water	1 quart

A transparent, dip process patina. A preservative is necessary.

7. Light Green (De Marco)

Ammonium Chloride	16 units
Sodium Chloride	16 units
Ammonium Hydroxide	16 units

A cold process, opaque patina which should be applied at 12 hour intervals for several days. A preservative is optional. For deeper green add 16 units of copper sulphate.

8. Brown to Black (Clarke)

Antimony Sulphide..........................2 parts by weight
Sodium Hydroxide (lye)...............4 parts by weight
Water..256 parts by weight

An excellent, hot process, semi-opaque patina. Color appears immediately after application. This patina can also be applied cold. A preservative is necessary.

9. Basic brown to black (Clarke)

Potassium Sulphide......................A grape size lump (crushed)
Water...1 pint

A transparent, hot or cold process patina that can be used only once, otherwise the solution becomes neutral. A preservative is optional.

10. Purple (De Marco)

RCB tried 4/2/97 @ 3 lg crystals in ~$\frac{1}{8}$ c water, thick, even, deep purple w/ some brown results easily. Extremely thin version still gets definite but transparent purple over blgn.

Over a copper nitrate, hot process patina (#16) apply a coat of saturated potassium ferrocyanide to the heated bronze. A preservative is optional.

11. Despiau Black (De Marco)

A. Acquire a light green base with a hot process, copper nitrate solution (#16)
B. Then apply a light coat of brown with a ferric nitrate patina solution (#1)
C. Mix batch (A) of ammonium sulphide......1/2 teaspoon
ferric nitrate..........1/2 teaspoon
water.......................1/2 pint
D. Mix batch (B) of potassium sulphate.....1/2 teaspoon
ferric nitrate..........1/2 teaspoon
water.......................1/2 pint
E. Then apply solution to a hot bronze surface in the following fashion until the desired effect is achieved. Apply batch (A) then water, apply batch (B) then water, apply batch (A) etc.

12. White (Soroka)

Diluted liquid Gesso is painted to the surface of the metal and buffed down slightly with steel wool or a brush as desired. Powdered colors can be added to the Gesso. A preservative is not necessary although a light spray of acrylic can be used on patches of exposed bronze.

13. Straw Yellow (Soroka)

Home Made Ferric Nitrate grounds.1/2 teaspoon
Water......................................1/2 pint

(A hot process patina)

Ferric nitrate is made by filling a pint jar half full of rusty nails and then pouring nitric acid over these nails until 1/4 of the jar is filled. This should be done outdoors for the resulting fumes are highly toxic. The mixture gets better with age, however, the patina solution can only be used once. A preservative is optional on this transparent patina.

14. Nickel Plate

Nickel Sulfate......................24 ounces
Ammonium chloride...............3.3 ounces
Boric Acid.............................4 ounces
Water....................................1 gallon

110 degrees to 140 degrees F.
25 to 50 amps./sq. ft.

Varied effects can be achieved by blocking out areas with lacquer, as a result cool and warm areas are achieved on the same piece.

15. Peacock Blue (Krause)

Sodium Thiosulphate	150 G./1.
Lead Acetate	25 G.
Cream of Tartar	30 G.
Water	1 liter

An intense, dip process, transparent patina. Immerse object from 20 to 30 minutes. A preservative should be applied immediately after the solution is removed and dried.

16. Basic Green (Clarke)

Copper Nitrate	1 teaspoon
Water	1 pint

A hot process, semi-transparent patina. A fresh mixture is necessary for each coloring. A preservative is optional.

17. Basic Blue-Black (Clarke)

Ammonium Sulphide	1 teaspoon
Water	1 pint

A hot or cold process, transparent patina. A preservative is optional.

18. Chromium Plate

Chromic Acid	53 ounces
Sulphate	0.53 ounces
Water	1 gallon

120 Degrees F.
200 amps/sq. ft.
Same characteristics as nickel plate formula.

19. Blue-Green

Bronze object should be buried in sawdust, saturated with vinegar for several days, with additional sprinkling of vinegar if necessary. The patina is heavily opaque. A preservative is optional.

20. Antique White (Soroka)

Bismuth Nitrate	2 teaspoon
Water	1 pint
Potassium Sulphide	A pinch

An excellent, semi-opaque, hot process patina. The object should be slightly oxidized with the torch before the solution is applied. Ferric Nitrate or Copper Nitrate may be substituted for The potassium Sulphide, depending upon the effect desired. A preservative is not necessary.

21. Brown (Clark with variatio

Sodium Thiosulphate	1 part by weight
Ferric Nitrate	8 parts by weight
Water	128 parts by weight

An excellent cold process, opaque patina, works well without a preservative.

22. Verde

Copper Sulphate	8 parts by weight
Ammonium Chloride	4 parts by weight
Sodium Chloride	4 parts by weight
Zinc Chloride	1 part by weight
Glacial Acetic Acid	3 parts by weight
Water	128 parts by weight

A dip process patina, immerse object in solution for a few minutes, then remove. Repeat until a color appears. A preservative is optional.

23. Metallic Blue-Black

Yellow Barium Sulphide	1 part by weight
Water	128 parts by weight

A dip process, semi-opaque patina, immerse object in solution overnight at normal temperature. A preservative is necessary.

24. Japanese Brown

Copper Sulphate	5 ounces
Cupric Acetate	5 ounces
Copper Carbonate	5 ounces
Water	1 gallon

A transparent, dip process patina. Preservative is optional.

25. Wine Vinegar Green (De Marco)

Red or White Wine Vinegar	1/2 liter
Water	1/2 liter
Ammonium Hydroxide	1 tablespoon
Muriatic Acid	1 tablespoon
Sodium Chloride(Salt)	1 teaspoon
Ammonium Chloride	100 grams

An excellent, cold process, opaque patina. Apply solution for several days at 12 hour intervals. A preservative is optional.

26. Fire-Oxide Bronze

Bronze casting as it appears when broken from a plaster investment and buffed slightly with a wire brush.

27. Raw 85-5-5-5 Bronze

Bronze as it appears after a cleaning in a diluted Nitric Acid pickle. 85 % copper, 5% tin, 5% lead, 5% zinc.

28. Heat oxidized and reduction flame patina.

Raw bronze as it appears after being heated with an Acetylene torch using a heavy reducing flame. When a black coating appears it is buffed down with steel wool and a soft cloth. A preservative is optional.

29. Apple Green

Sodium Chloride	5 parts by weight
Ammonia	4 parts by weight
Ammonium Chloride	5 parts by weight
Glacial Acid	4 parts by weight
Water	32 parts by weight

A cold process, heavy opaque patina, Preservative is optional.

30. Transparent Black (Gadberry)

Chlormoauric Acid Crystals or cold chloride	1/2 gram
Water	100 ml.

For immediate results paint or spray(with glass atomizer) one coat of this solution. Can also be used as a dip. A preservative is optional

.	Constituent	Symbol	oz/gal	fl oz/ga
BRASS				
1	Green			
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	8	---
	Lead acetate	$Pb(C_2H_3O_2)_2 \cdot 3H_2O$	1-3	---
	Temp 180°F			
2	Green			
	Copper sulfate	$CuSO_4 \cdot 5H_2O$	12	---
	Ammonium chloride	NH_4Cl	2	---
3	Green			
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	4	---
	Sulfuric acid (sp gr 1.84)	H_2SO_4	--	1.6
	Temp room			
4	Green-blue (Flemish)			
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	4	---
	Lead acetate	$Pb(C_2H_3O_2)_2 \cdot 3H_2O$	2-4	---
	Temp 170-190°F			
5	Green bronze			
	Copper sulfate	$CuSO_4 \cdot 5H_2O$	1.5	---
	Ferrous sulfate	$FeSO_4 \cdot 7H_2O$	1.25	---
	Sodium carbonate	Na_2CO_3	0.5	---
	Temp hot			
6	Green russet bronze			
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	8	---
	Nitric acid (sp gr 1.41)	HNO_3	--	0.25
	Temp room			
7	Hardware green			
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	8	---
	Nickel sulfate	$NiSO_4 \cdot 6H_2O$	2-8	---
	Temp 160-200°F			
8	Light green			
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	6-8	---
	Ferric nitrate	$Fe(NO_3)_3 \cdot 6H_2O$	2-3	---
	Temp 140-200°F			
9	Light olive			
	Copper (ic) chloride	$CuCl_2 \cdot 2H_2O$	8	---
	Ferric chloride	$FeCl_3 \cdot 6H_2O$	8	---
10	Olive antique green			
	Dip 1			
	Potassium polysulfide	K_2S_x	0.33	---
	Methyl orange indic soln		--	(5 ml/gal)
	Temp room			
	Dip 2			
	Ferric nitrate	$Fe(NO_3)_3 \cdot 6H_2O$	8	---
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	2	---
	Temp room			

	Constituent	Symbol	oz/gal	fl oz/gal
11	Olive green			
	Nickel ammonium sulfate	$NiSO_4 \cdot (NH_4)_2SO_4$ $6H_2O$	8	---
	Sodium thiosulfate	$Na_2S_2O_3 \cdot 5H_2O$	8	---
	Temp boiling			
12	Olive green			
	Copper sulfate	$CuSO_4 \cdot 5H_2O$	8	---
	Ammonium chloride	NH_4Cl	2	---
	Temp boiling			
13	Verd antique patina			
	Sodium dichromate	$Na_2Cr_2O_7 \cdot 2H_2O$	12	---
	Copper sulfate	$CuSO_4 \cdot 5H_2O$	4	---
BRASS PLATE				
1	Green			
	See BRASS 3			
2	Green russet bronze			
	See BRASS 7			
BRONZE				
1	Light medium green			
	See BRASS 6			
2	Light olive			
	See BRASS 9			
3	Olive			
	See BRASS 10			
4	Verd antique			
	See BRASS 13			
COPPER				
1	Dark green			
	See BRASS 6			
2	Tiffany green			
	Copper sulfate	$CuSO_4 \cdot 5H_2O$	8	---
	Ammonium chloride	NH_4Cl	8	---
	Sodium chloride	$NaCl$	4	---
	Zinc chloride	$ZnCl_2$	1	---
	Acetic acid (glacial)	CH_3COOH	--	0.5
	Glycerin	$CHOH(CH_2OH)_2$	--	1
3	Verd antique			
	See BRASS 13			
BRASS				
	Red			
	Copper (ic) nitrate	$Cu(NO_3)2 \cdot 6H_2O$	8	---
	Oxalic acid	$(COOH)_2$	8	---
	Temp hot			

For your chemical needs
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PATINA FORMULAS FOR BRASS, BRONZE AND COPPER

1. LIGHT TO DARK-BROWN (BASIC BROWN) (Clarke with Variations[1])

Ferric Nitrate	1-4 tablespoons
Water	1 pint

A hot process, transparent color. Fresh mixture necessary for each coloring. A preservative is optional.

2. Antique green (Miller)

Cupric Nitrate	40 grams
Ammonium Chloride	40 grams
Calcium Chloride	40 grams
Water	To make one liter (approx. 1 qt)

A cold process, opaque patina. Frog green results after several applications, ½ hour intervals. Color is not satisfactory alone. Combines well with most brown and black cold process patinas. A preservative is optional.

3. Matte Brown (Rich)

Barium Sulfide	1 ounce
Potash (Sulfurated)	¼ ounce
Ammonia	2 fluid ounces
Water	3 to 5 quarts

An excellent cold process, opaque patina that darkens immediately after application. The matte color is best without a preservative, although it is optional.

4. Yellow Green (Clarke)

Ammonium Chloride	7 parts by weight
Copper Acetate	4 parts by weight
Water	8 parts by weight

A cold process, heavy opaque patina that takes effect after several applications. A preservative is optional.

5. Rust Brown (Payne)

Ferric Nitrate	3 ounces
Ferric Chloride	2 ounces
Water	1 to 3 quarts

An excellent, cold process, opaque patina. It achieves immediate results. A preservative is not necessary.

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6. Blue

(Miller)

Sodium Thiosulfate	60 grams
Nitric Acid 35%	2 teaspoons
Water	1 quart

A transparent, dip process patina. A preservative is necessary.

This Patina is reported to produce a grey blue when tap water is used.

7. Light Green

(De Marco)

Ammonium Chloride	16 parts
Sodium Chloride	16 parts
Ammonium Hydroxide	16 parts

A cold process, opaque patina which should be applied at 12 hour intervals for several days. A preservative is optional. For a deeper green add 16 parts of cupric sulfate.

8. Brown to Black

(Clarke)

Antimony Sulfide	2 parts
Sodium Hydroxide	4 parts
Water	256 parts

An excellent, hot process, semi-opaque patina. Color appears immediately after application. This patina can also be applied cold. A preservative is necessary.

9. Basic Brown to Black

(Clarke)

Potash (Sulfurated)	A grape size lump (crushed) •
Water	1 pint

A transparent, hot or cold process patina that can be used only once, otherwise the solution becomes neutral. A preservative is optional.

10. Purple

(De Marco with Variations[1])

Over a cupric nitrate, hot process patina (#16), apply a coat of saturated potassium ferricyanide to the heated bronze. A preservative is optional. Method of application: Remove when 2nd red appears for purple. The patina will turn blue if left too long.

This patina is reported to be more red with some purple.

11. Shimmering Grey

(Young with Variations[1])

Silver Nitrate	8 grams
Water	1 pint

This is a hot process patina. The hotter the piece, the greater the silver appearance. Reheating the piece and rubbing it with a 000 steel wool will raise the shimmering qualities of your sculpture. This patina works well as an undercoat or as an overcoat to almost any patina.

12. Silver

(Young)

Silver Nitrate	30 grams
Water	1 pint

This is a hot process patina. The hotter the piece, the greater the silver appearance. Reheating the piece and rubbing it with a 000 steel wool will raise the shimmering qualities of your sculpture. This patina works well as an undercoat to almost any patina.

13. Cobalt Blue

(Anonymous with Variations[1])

Mix #1

Cupric Nitrate	125 grams
Cobalt Nitrate	85 grams
Water	1 gallon

Mix #2

Cupric Nitrate	250 grams
Water	1 gallon

This is a hot process patina. It is a semi-transparent, blue and black, marbled patina.

Mix solution #1 and solution #2 together in a one-to-one ratio. Spray combined solution over the heated metal. This recipe requires several applications (too many applications will result in the patina flaking). A preservative is optional.

14. Aqua Marine Blue

(Anonymous with Variations[1])

Cupric Nitrate	250 grams
Blue Dye	
(Cerulean Blue)	2 ounces
or	
(Methylene Blue)	2 grams
Water	1 gallon

This is a hot process semi-transparent patina which is light aqua blue in color. It works well in combination with the other hot process blue and green patinas. A preservative is optional.

15. Basic Green

(Clark with Variations[1])

Cupric Nitrate	1-4 tablespoons
Water	1 pint

A hot process, semi-transparent patina. A fresh mixture is necessary for each coloring. A preservative is optional.

16. Peacock Blue

(Krause)

Sodium Thiosulfate	150 grams
Lead Acetate	25 grams
Potassium Bitartrate	30 grams
Water	1 liter

An intense, dip process, transparent patina. Immerse object for 20 to 30 minutes. A preservative should be applied immediately after the solution is removed and dried.

17. Basic Blue-Black

(Clarke)

Ammonium Sulfide	1-3 teaspoons
Water	1 pint

A hot or cold process, transparent patina. A preservative is optional.

18. Blue Green

(Anonymous)

Bronze object should be buried in sawdust, saturated with vinegar for several days, with additional sprinkling if necessary. The patina is heavily opaque. A preservative is optional.

19. Antique White

(Soroka)

Bismuth Nitrate	2 teaspoons
Water	1 pint
Potash (Sulfurated)	A pinch

An excellent, semi-opaque, hot process patina. The object should be slightly oxidized with the torch before the solution is applied. Ferric Nitrate or Cupric Nitrate may be substituted for the Potash (Sulfurated), depending upon the effect desired. A preservative is not necessary.

20. Brown

(Clarke with Variations[1])

Sodium Thiosulfate	1 part
Ferric Nitrate	8 parts
Water	128 parts

An excellent cold process, opaque patina, works well without a preservative.

21. Verde

(Anonymous)

Cupric Sulfate	8 parts
Ammonium Chloride	4 parts
Sodium Chloride	4 parts
Zinc Chloride	1 part
Acetic Acid, Glacial	3 parts
Water	128 parts

A dip process patina. Immerse object in solution for a few minutes, then remove. Repeat until a color appears. A preservative is optional. This patina is reported to produce more of a turquoise than a green. Color appears when removed from solution.

It is o.k. to brush solution on.

22. Metallic Blue-Black

(Anonymous)

Barium Sulfide	1 part
Water	128 parts

A dip process, semi-opaque patina. Immerse object in solution overnight at normal temperature. A preservative is necessary.

23. Japanese Brown *(This is a Green Patina)*

(Anonymous)

Cupric Sulfate	5 ounces
Cupric Acetate	5 ounces
Cupric Carbonate	5 ounces
Water	1 gallon

A transparent, dip process patina. Preservative is optional.

24. Wine Vinegar Green

(De Marco)

Red or White Wine Vinegar	1 pint
Water	1 pint
Ammonium Hydroxide	1 tablespoon
Muriatic Acid	1 tablespoon
Sodium Chloride	1 teaspoon
Ammonium Chloride	100 grams

An excellent, cold process, opaque patina. Apply solution for several days at 12 hour intervals. A preservative is optional.

25. Apple Green (Anonymous)

Sodium Chloride	5 parts
Ammonia	4 parts
Ammonium Chloride	5 parts
Acetic Acid, Glacial	4 parts
Water	32 parts

A cold process, heavy opaque patina. A preservative is optional.

26. Transparent Black (Gadberry)

Gold Chloride Crystals	½ gram
Water	100 ml

For immediate results paint or spray one coat of this solution. Can also be used as a dip. A preservative is optional.

27. Antique Green (Colman with Variations[1])

Step #1
Do a hot process "Basic Green" patina (#15)

Step #2
While the piece is still hot apply a solution of:

Potassium Thiosulfate	2 ounces
Water	1 quart

This is a beautiful and versatile patina. Different results can be achieved by substituting Ferric Nitrate or Ferric Chloride for the Potassium Thiosulfate.

28. Royal Blue (Hess)

Cupric Sulfate	8 parts
Ammonium Chloride	4 parts
Sodium Chloride	1 part
Acetic Acid, Glacial	3 parts
Water	128 parts

An excellent hot process semi-transparent patina. It works as a cold process as well.

29. White (Young)

Bismuth Nitrate	3 ounces
Stannic Oxide	1 ounce
Titanium Dioxide	1 ounce
Water	24 ounces

Mix the above ingredients and add 1-2 ounces colloidal silica. Let this solution rest for 3 days before using. This is a hot process patina. If you find more bite is necessary, add 5 or 6 drops of nitric acid.

30. Natural Green (Anonymous with Variations[1])

Ammonium Chloride	8 parts
Cupric Sulfate	8 parts
Water	128 parts

Cold process patina which needs a preservative if contact is expected. Works well with brown patinas.

Reported to be dusty. **It is all right to vary chemical content to change the color slightly.**

31. Sunrise Colors (Haws with Variations')

Dip #1

Sufuric Acid	1 part
Water	Approximately 10 to 15 parts

Dip #2

Potash	1 small lump
Water	Approximately 1 pint to 1 quart

Dip or brush with dip #1 then dip in fresh water. Dip or brush with dip #2 then dip in fresh water. Dip or brush with dip #1 then dip in fresh water. Continue until desired results are achieved.

Reported to work best on plated brass surfaces.

BRASS

1. Green

Sodium thiosulfate	8 oz
Lead acetate	1-3 oz
Water	1 gal

2. Green

Cupric sulfate	12 oz
Ammonium chloride	2 oz
Water	1 gal

3. Green

Sodium thiosulfate	4 oz
Sulfuric acid (sp gr 1.84)	1.6 fluid oz
Water	1 gal

Temperature: room

4. Green-blue (Flemish)

Sodium thiosulfate	4 oz
Lead acetate	2-4 oz
Water	1 gal

Temperature: 170-190 F

5. Green bronze

Cupric sulfate	1.5 oz
Ferrous sulfate	1.25 oz
Sodium carbonate Anhy	0.5 oz
Water	1 gal

Temperature: hot

6. Green russet bronze

Sodium thiosulfate	8 oz
Nitric acid 35%	0.5 fluid oz
Water	1 gal

Temperature: room

7. Hardware green

Sodium thiosulfate	8 oz
Nickel sulfate	2-8 oz
Water	1 gal

Temperature: 160-200 F

8. Light green

Sodium thiosulfate	6-8 oz
Ferric nitrate	2-3 oz
Water	1 gal

Temperature: 140-200 F

9. Light olive

Cupric chloride	8 oz
Ferric chloride	8 oz
Water	1 gal

10. Olive antique green

Dip 1

Potash (Sulfurated)	0.33 oz
Methyl orange indicator solution	5 ml
Water	1 gal

Temperature: room

Dip 2

Ferric nitrate	8 oz
Sodium thiosulfate	2 oz
Water	1 gal

Temperature: room

11. Olive green

Nickel ammonium sulfate	8 oz
Sodium thiosulfate	8 oz
Water	1 gal

Temperature: boiling

12. Olive green

Cupric sulfate	8 oz
Ammonium chloride	2 oz
Water	1 gal

Temperature: boiling

BRASS PLATE

1. Green	See BRASS 3
2. Green russet bronze	See BRASS 7

BRONZE

1. Light medium green	See BRASS 6
2. Light olive	See BRASS 9
3. Olive	See BRASS 10

COPPER

1. **Dark green** .... See BRASS 6
2. **Tiffany green**

Cupric sulfate	8 oz
Ammonium chloride	8 oz
Sodium chloride	4 oz
Zinc chloride	1 oz
Acetic acid, glacial	0.5 fluid oz
Glycerin	1 fluid oz
Water	1 gal

For more information on patination:

"CONTEMPORARY PATINATION"
RON YOUNG 34.95
featuring color plates for most patina recipes

"THE ART OF PATINAS FOR BRONZE"
M.S. EDGE 24.95
featuring marbled patinas and other innovative recipes

"METHODS FOR MODERN SCULPTURES"
YOUNG AND FENNEL 14.95
featuring patina recipes and also instructions on ceramic shell casting

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[1] All Variations courtesy of T. Rohan.

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PATINA FORMULAS FOR BRASS, BRONZE AND COPPER

1. LIGHT TO DARK-BROWN (BASIC BROWN)

(Clarke with Variations[1])

Ferric Nitrate	1-4 tablespoons
Water	1 pint

*A hot process, transparent color. A fresh mixture is necessary for each coloring. A preservative is optional.

2. Antique green

(Miller)

Cupric Nitrate	40 grams
Ammonium Chloride	40 grams
Calcium Chloride	40 grams
Water	To make one liter (approx. 1 qt)

*A cold process, opaque patina. Frog green results after several applications, ½ hour intervals. This patina combines well with most brown and black cold process patinas. A preservative is optional.

3. Matte Brown

(Rich)

Barium Sulfide	1 ounce
Potash (Sulfurated)	¼ ounce
Ammonia	2 fluid ounces
Water	3 to 5 quarts

*An excellent cold process, opaque patina that darkens immediately after application. The matte color is best without a preservative, although it is optional.

4. Yellow Green

(Clarke)

Ammonium Chloride	7 parts by weight
Copper Acetate	4 parts by weight
Water	8 parts by weight

*A cold process, heavy opaque patina that takes effect after several applications. A preservative is optional.

5. Rust Brown

(Payne)

Ferric Nitrate	3 ounces
Ferric Chloride	2 ounces
Water	1 to 3 quarts

*An excellent, cold process, opaque patina. It achieves immediate results. A preservative is not necessary.

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6. Blue

(Miller with Variations[1])

Sodium Thiosulfate	60 grams
Nitric Acid 35%	2 teaspoons
Water	1 quart

*A transparent, dip process patina. A preservative is necessary.

This Patina is reported to produce a grey blue when tap water is used.

7. Light Green

(De Marco with Variations[1])

Ammonium Chloride	16 parts
Sodium Chloride	16 parts
Ammonium Hydroxide	16 parts

*A cold process, opaque patina which should be applied at 12 hour intervals for several days. A preservative is optional. For a deeper green add 16 parts of cupric sulfate.

8. Brown to Black

(Clarke)

Antimony Sulfide	2 parts
Sodium Hydroxide	4 parts
Water	256 parts

An excellent, hot process, semi-opaque patina. Color appears immediately after application. This patina can also be applied cold. A preservative is necessary.

9. Basic Brown to Black

(Clarke)

Potash (Sulfurated)	A grape size lump (crushed)
Water	1 pint

*A transparent, hot or cold process patina that can be used only once, otherwise the solution becomes neutral. A preservative is optional.

10. Purple

(De Marco with Variations[1])

*Over a cupric nitrate, hot process patina (#15), apply a coat of saturated potassium ferricyanide to the heated bronze. A preservative is optional. Method of application: Remove when 2nd red appears for purple. The patina will turn blue if left too long.The author has found this patina to be extremely sensitive; good results are hard to achieve.

This patina is reported to be more red with some purple.

11. Shimmering Grey

(Young with Variations[1])

Silver Nitrate	8 grams
Water	1 pint

*This is a hot process patina. The hotter the piece, the greater the silver appearance. Reheating the piece and rubbing it with a 000 steel wool will raise the shimmering qualities of your sculpture. This patina works well as an undercoat or as an overcoat to almost any patina.

12. Silver

(Young)

Silver Nitrate	30 grams
Water	1 pint

*This is a hot process patina. The hotter the piece, the greater the silver appearance. Reheating the piece and rubbing it with a 000 steel wool will raise the shimmering qualities of your sculpture. This patina works well as an undercoat to almost any patina.

13. Cobalt Blue (Anonymous with Variations[1])

Mix #1

Cupric Nitrate	125 grams
Cobalt Nitrate	85 grams
Water	1 gallon

Mix #2

Cupric Nitrate	250 grams
Water	1 gallon

*This is a hot process patina. It is a semi-transparent, blue and black, marbled patina.

Mix solution #1 and solution #2 together in a one-to-one ratio. Spray combined solution over the heated metal. This recipe requires several applications (too many applications will result in the patina flaking). A preservative is necessary.

14. Aqua Marine Blue (Anonymous with Variations[1])

Cupric Nitrate	250 grams
Blue Dye	
(Cerulean Blue)	2 oz.
or	
(Methylene Blue)	2 grams
Water	1 gallon

*This is a hot process semi-transparent patina which is light aqua blue in color. It works well in combination with the other hot process blue and green patinas. A preservative is optional.

15. Basic Green (Clark with Variations[1])

Cupric Nitrate	1-4 tablespoons
Water	1 pint

*A hot process, semi-transparent patina.

16. Peacock Blue (Krause)

Sodium Thiosulfate	150 grams
Lead Acetate	25 grams
Potassium Bitartrate	30 grams
Water	1 liter

*An intense, dip process, transparent patina. Immerse object for 20 to 30 minutes. A preservative should be applied immediately after the solution is removed and dried.

17. Basic Blue-Black (Clarke with Variations[1])

Ammonium Sulfide	1-3 teaspoons
Water	1 pint

A hot or cold process, transparent patina. A preservative is optional. This is a nice fumed patina when used 2-4 tablespoons per pint of water.

18. Blue Green (Anonymous)

*Bronze object should be buried in sawdust, saturated with vinegar for several days, with additional sprinkling if necessary. The patina is heavily opaque. A preservative is optional.

(Soroka)

19. Antique White

Bismuth Nitrate	2 teaspoons
Water	1 pint
Potash (Sulfurated)	A pinch

*This is a semi-opaque, hot process patina. The object should be slightly oxidized with the torch before the solution is applied. Ferric Nitrate or Cupric Nitrate may be substituted for the Potash (Sulfurated), depending upon the effect desired. A preservative is not necessary. The author has found that this patina is a poor substitute for the #29 white. You might like to try that patina instead.

(Clarke with Variations[1])

20. Brown

Sodium Thiosulfate	1 part
Ferric Nitrate	8 parts
Water	128 parts

*An excellent cold process, semi-opaque patina. It works well without a preservative. The author has found it to be a very pleasing patina.

(Anonymous with Variations[1])

21. Verde

Cupric Sulfate	8 parts
Ammonium Chloride	4 parts
Sodium Chloride	4 parts
Zinc Chloride	1 part
Glacial Acetic Acid	3 parts
Water	128 parts

*This is a dip process patina, immerse object in solution for a few minutes, then remove. Repeat until a color appears. A preservative is optional. This patina is reported to produce more of a turquoise than a green. Color appears when removed from solution.

It is o.k. to brush solution on.

(Anonymous)

22. Metallic Blue-Black

Barium Sulfide	1 part
Water	128 parts

*A dip process, semi-opaque patina, immerse object in solution overnight at normal temperature. A preservative is necessary.

(Anonymous)

23. Japanese Brown *(This is a Green Patina)*

Cupric Sulfate	5 ounces
Cupric Acetate	5 ounces
Cupric Carbonate	5 ounces
Water	1 gallon

A transparent, dip process patina. Preservative is optional.

(De Marco)

24. Wine Vinegar Green

Red or White Wine Vinegar	1 pint
Water	1 pint
Ammonium Hydroxide	1 tablespoon
Muriatic Acid	1 tablespoon
Sodium Chloride	1 teaspoon
Ammonium Chloride	100 grams

An excellent, cold process, opaque patina. Apply solution for several days at 12 hour intervals. A preservative is optional.

25. Apple Green (Anonymous)

Sodium Chloride	5 parts
Ammonia	4 parts
Ammonium Chloride	5 parts
Acetic Acid, Glacial	4 parts
Water	32 parts

A cold process, heavy opaque patina. A preservative is optional.

26. Transparent Black (Gadberry)

Gold Chloride Crystals	½ gram
Water	100 ml

*For immediate results paint or spray one coat of this solution. Can also be used as a dip. A preservative is optional.

27. Antique Green (Colman with Variations[1])

Step #1
Do a hot process "Basic Green" patina (#15)

Step #2
While the piece is still hot apply a solution of:

Potassium Thiosulfate	2 ounces
Water	1 quart

*This is a beautiful and versatile patina. Different results can be achieved by substituting Ferric Nitrate or Ferric Chloride for the Potassium Thiosulfate.

28. Royal Blue (Hess)

Cupric Sulfate	8 parts
Ammonium Chloride	4 parts
Sodium Chloride	1 part
Glacial Acetic Acid	3 parts
Water	128 parts

An excellent hot process semi-transparent patina. It works as a cold process as well.

29. White (Young)

Bismuth Nitrate	3 ounces
Stannic Oxide	1 ounce
Titanium Dioxide	1 ounce
Water	24 ounce

*Mix the above ingredients and add 1-2 ounces colloidal silica. Let this solution rest for 3 days before using. This is a hot process patina. If you find more bite is necessary, add 5 or 6 drops of nitric acid.

30. Natural Green (Anonymous with Variations[1])

Ammonium Chloride	8 parts
Cupric Sulfate	8 parts
Water	128 parts

*This is a cold process patina which needs a preservative if contact is expected. Works well with brown patinas.

Reported to be dusty.

It is all right to vary chemical content to change the color slightly.

31. Sunrise Colors (Haws with Variations[1])

Dip #1

Sulfuric Acid	1 part
Water	Approximately 10 to 15 parts

Dip #2

Potash	1 small lump
Water	Approximately 1 pint to 1 quart

*Dip or brush with dip #1 then dip in fresh water. Dip or brush with dip #2 then dip in fresh water. Dip or brush with dip #1 then dip in fresh water. Continue until desired results are achieved. A preservative is necessary.

Reported to work best on plated brass surfaces.

32. Rust Brown/Black/Red (Anonymous/Rohan)

Step #1

Citric Acid	1-2 teaspoons
Water	1 pt

Step #2

Rinse well with water.

Step #3

Potash	pea-sized lump
Water	2-3 gallon

Step #4

Rinse well with water.

Steps 3 and 4 may be repeated until your desired results are achieved.

*This patina works very well to attain a red/brown heavily verigated patina. A preservative is necessary immediately after application.

BRASS

1. Green

Sodium thiosulfate	8 oz
Lead acetate	1-3 oz
Water	1 gal

2. Green

Cupric sulfate	12 oz
Ammonium chloride	2 oz
Water	1 gal

3. Green

Sodium thiosulfate	4 oz
Sulfuric acid (sp gr 1.84)	1.6 fluid oz
Water	1 gal

Temperature: room

4. Green-blue (Flemish)

Sodium thiosulfate	4 oz
Lead acetate	2-4 oz
Water	1 gal

Temperature: 170-190 F

5. **Green bronze**

Cupric sulfate	1.5 oz
Ferrous sulfate	1.25 oz
Sodium carbonate Anhy	0.5 oz
Water	1 gal

Temperature: hot

6. **Light green**

Sodium thiosulfate	6-8 oz
Ferric nitrate	2-3 oz
Water	1 gal

Temperature: 140-200 F

7. **Light olive**

Cupric chloride	8 oz
Ferric chloride	8 oz
Water	1 gal

8. **Olive antique green**

Dip 1

Potash (Sulferated)	0.33 oz
Methyl orange indicator solution	5 ml
Water	1 gal

Temperature: room

Dip 2

Ferric nitrate	8 oz
Sodium thiosulfate	2 oz
Water	1 gal

Temperature: room

9. **Olive green**

Cupric sulfate	8 oz
Ammonium chloride	2 oz
Water	1 gal

Temperature: boiling

BRASS PLATE

1. **Green**	See BRASS 3

BRONZE

1. **Light olive**	See BRASS 7
2. **Olive**	See BRASS 8

COPPER

1. **Tiffany green**

Cupric sulfate	8 oz
Ammonium chloride	8 oz
Sodium chloride	4 oz
Zinc chloride	1 oz
Acetic acid, glacial	0.5 fluid oz
Glycerin	1 fluid oz
Water	1 gal

For more information on patination we offer the following literature:

"CONTEMPORARY PATINATION"		
RON YOUNG	39.95	*featuring color plates for most patina recipes*
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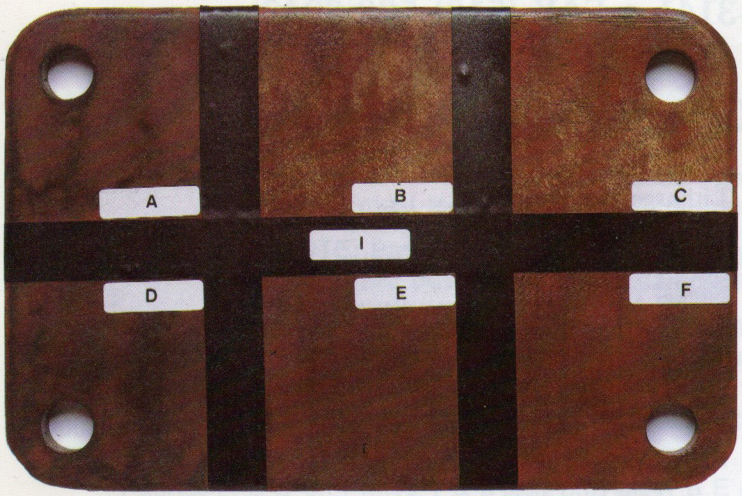
*All comments courtesy of T.B. Rohan, patina specialist.

[1] All Variations courtesy of T.B. Rohan, patina specialist

PATINA RECIPES

All plates and patinas courtesy of Ron Young

The top half of all the plates were polished with a very fine SCOTCH BRITE-SM-ROLOC surface-conditioning disc. This appears to work very well. It is especially good for hot, transparent patinas.



(PLATE 1)

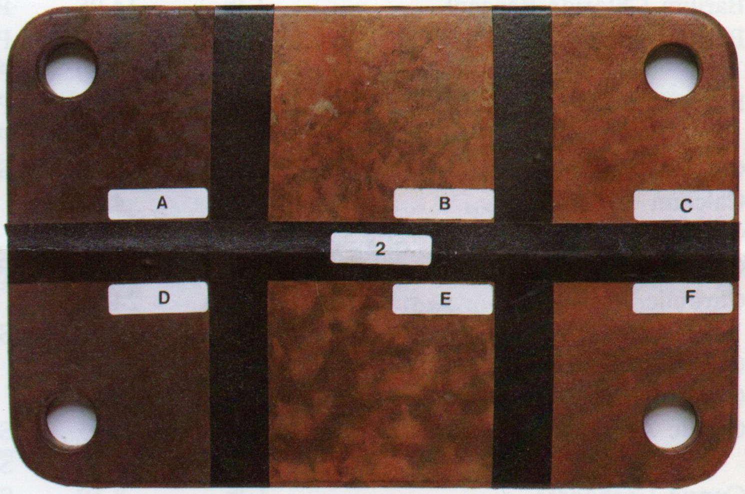
HOT PATINA:

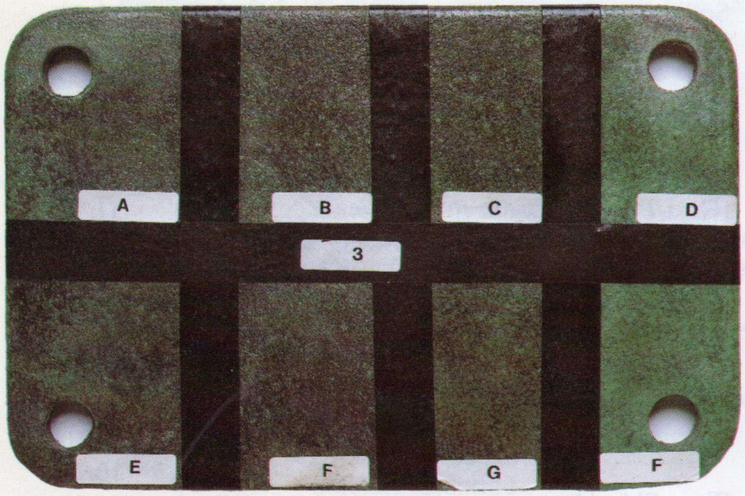
All of the patinas were applied steaming hot and washed, while still hot, with warm water (you may, however, wish **not** to wash after the patina). They were then left alone for 24 hours and it was noted that patinas got redder and richer with time. Patinas were then sprayed with two coats of INCRALAC.

(PLATE 2)

COLD PATINA:

The patinas were applied cold and left for six hours before washing with water. On the SCOTCH BRITE surface, the Red color tended to wash out, but it came back, in time, so you may wish to wash lightly. The application of the patina went much better on sand-blasted surfaces. After the patina was applied, the plates were left outside for 48 hours before spraying on two coats of INCRALAC.





(PLATE 3)

BURIED PATINA:

All three of the red patinas were put on the bronze plate (top half SCOTCH BRITE, bottom half sand-blasted, last section (D & F) plain clean bronze). The plate which had the patina was then buried for 24 hours in sawdust mixed with a green patina formula.

The green/blue formula was strong and the plates may have been left in the sawdust too long for the reds to show. For red enhancement, you may want to limit the time in sawdust to two or three hours.

These samples were not washed and were left outside for 72 hours before spraying with two coats of INCRALAC. All the patination was done under studio conditions.

(For all formulas, see page 3)

Sculpture "1744763-590"
by Max Cregar

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PATINA FORMULAS

By Ron Young

SAMPLE PATINAS

METAL ALLOY	Everdur bronze plate	0.5" thick
	Copper	95%
	Silicon	4%
	Manganese	0.85%
	Iron	0.15%

These patina formulas appear to get better with time, however most formulas do deteriorate very quickly once they begin to neutralize.

NOTE: Patina may be applied to any surface from horizontal to vertical. However, the patinas on these samples were applied to the horizontal surface.

CLEANING OF BRONZE PLATES: All bronze plates were sandblasted (85 to 100 PSI) with a very coarse, previously used mixture of STARBLAST sand containing Staurlite, Ilimenite, Leucoxene, Zircon, Quartz, and Kyanite.

FORMULA 1

Patinas A & D on Plates 1 & 2 and patinas A & E on Plate 3 (All sample plates located on page 1):
NOTE: Please read about chemicals before using.

Cupric Sulfate	6 tsp
Liver of Sulfur (Potash)	2 tsp
Iron Oxide, Red	11 tsp
Potassium Dichromate	6 tsp
Water	1 pint

FORMULA 2

Patinas B & E on Plates 1 & 2 and Patinas B & F on Plate 3 (All sample plates located on page 1):
NOTE: Please read about chemicals before using.

Sodium Dichromate	1 tbsp
Iron Oxide, Red	4 tbsp
Potassium Dichromate	2 tbsp
Potassium Ferricyanide	1 tbsp
Water	1 pint

FORMULA 3

Patinas C & F on Plates 1 & 2 and patinas C & G on Plate 3 (All sample plates located on page 1):
NOTE: Please read about chemicals before using.

Sodium Dichromate	1 tbsp
Iron Oxide, Red	4 tbsp
Antimony Trisulfide	1 tsp
Zinc Chloride	4 tsp
Potassium Dichromate	2 tsp
Water (Warm distilled)	1 pint

NOTE: Antimony Trisulfide is difficult to mix with water and other chemicals. The Antimony Trisulfide will dissolve a bit easier when the water is warm (if needed, approximately six drops Muriatic Acid should allow it to dissolve even more easily).

FORMULA 4

Patina over Plate 3 (All sample plates located on page 1):

Glacial Acetic Acid	3 pints
Sodium Thiosulfate	32 oz
Calcium Chloride	32 oz
Ammonium Chloride	16 oz
Water	16 oz
Clean, white pine sawdust	30 gal

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